

Asbestos Class III Operations and Maintenance Training



Today's Topics

- Asbestos Background
- Health Effects
- Minimizing Workplace Exposure
- Overview of Regulations
- Asbestos Inspections
- Operations and Maintenance Programs
- Current Events

Asbestos Background

- What is Asbestos?
- Why Was It Used?
- Where and When Was It Used?
- Who Used It?

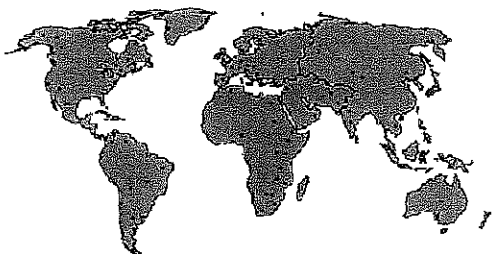
What is Asbestos?

- Asbestos is a naturally occurring mineral
- Asbestos comes from the Greek language and means "inextinguishable"



- Chrysotile asbestos
- Black Lake open pit asbestos mine, Canada

Significant Asbestos Deposits

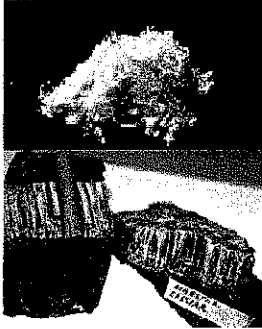


- Predominant deposits in Canada, South Africa, former Soviet Union and Australia

Types of Asbestos

- Serpentine – wavy and hollow, sheet or layered structure
 - Chrysotile
- Amphibole – long straight solid rods, chain like structure
 - Amosite, crocidolite
- Non-asbestiforms
 - Tremolite, anthophyllite, etc.

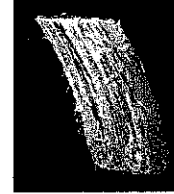
Forms of Asbestos - Chrysotile



- "White asbestos"
- The most abundant form
- Makes up 90-95% of all ACBM in US
- More flexible, longer thinner fibers
- Used as insulation, fireproofing and soundproofing
- Note fibrous, "cotton candy" form

Forms of Asbestos - Amosite

- "Brown asbestos"
- Used in high friction applications, insulation
- Second most common form of ACBM



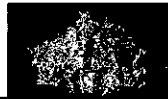
- Amosite is an acronym for Asbestos Mines of South Africa to which a mineral name ending "ite" has been added

Forms of Asbestos - Crocidolite

- "Blue asbestos"
- Used in specialized high temperature applications
- Highly chemical resistant – used in gas mask canisters in WWII



- Westerberg asbestos mine in South Africa



Other Forms of Asbestos

- Non-asbestiforms - Tremolite, anthophyllite, actinolite, etc.



- Were rarely used as the primary asbestos form in products
- Shown at left Tremolite-actinolite crystals in raw ore from Zonolite Mountain, Libby MT

Vermiculite

- When heated vermiculite "pops" (exfoliates)
- Raw fibrous form on right
- "Popped" form on left



Asbestos Background

- What is Asbestos?
- Why Was It Used?
- Where and When Was It Used?
- Who Used It?

The "Material of a Thousand Uses"

- Naturally occurring
- Cheap and abundant
- Once called "the miracle mineral" because of its durability

Useful Properties of Asbestos

- Flame and fire resistant
- Fibers are flexible enough to be spun and woven
- High tensile strength
- Resistant to acid, chemicals, decay and corrosion
- Excellent insulation qualities
- Poor electric conductor
- Good sound absorption

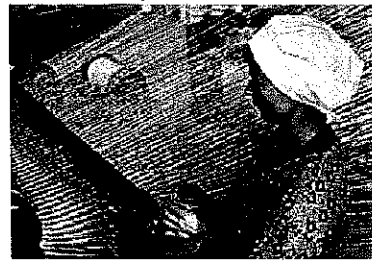


Fire Resistant

- Photo on the right is the asbestos core of a fire-rated door
- The top glove is an asbestos thermal mitten (70% chrysotile asbestos).



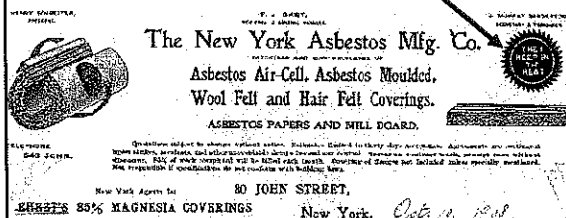
Can Be Spun and Woven



- One pound of asbestos fibers can be spun into strand 6 miles long
- Above - Weaver in the JM textile div. Circa 1934

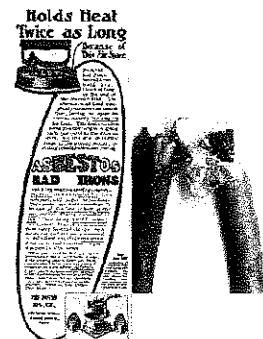
Excellent Insulation Properties

- Pictured below is a billhead from 1908
- Notice "THEY KEEP IN THE HEAT"



Poor Electric and Heat Conductor

- The ad on the right is for an asbestos sad iron from 1907
- The two wires on the far right have asbestos insulation (10-30% chrysotile)
- This was called "AF wire", for *asbestos fiber wire*



Good Sound Absorption



Widely used in the 1950s and '60s, asbestos acoustical plaster was a simple solution for acoustical ceilings

- College auditorium with acoustical plaster which is ACM

Asbestos Background

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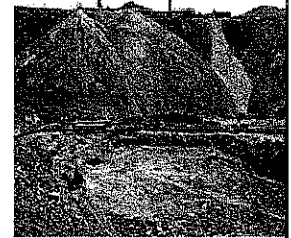
Historical References

- Use dates back 2000 years
- Stone Age - used to strengthen earthenware (Finland)
- 2,000 B.C. Egypt - wrapping embalmed pharaohs
- Greeks - lamp wicks, funeral dress
- Romans - cremation cloths
- Middle Ages - insulation in suits of armor



Commercial Usage

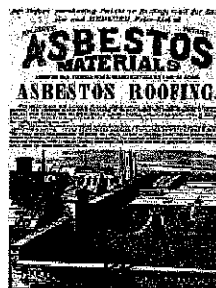
- Not commercially mined until 1879 – Thetford, Quebec



- Thetford, Quebec asbestos mine circa 1944

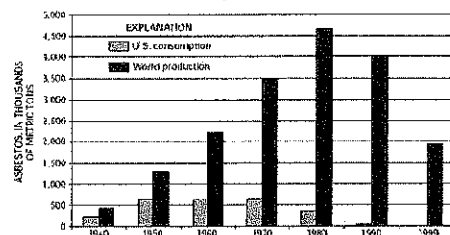
Commercial Usage

- Major production in industry started in late 1800's
- Pre-1900's mainly as insulation for boilers, steam engines
- Early 1900's spread to ships
- Post-World War II spread to buildings
- Peak period between 1950 and 1970



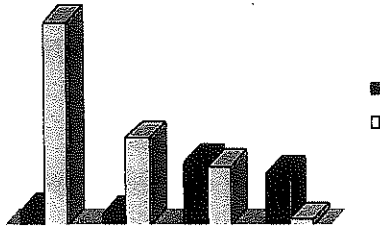
Originally, asbestos saved countless lives as a fireproofing material

Asbestos Usage



- At its peak, more than 3,000 products contained asbestos
- By 1950, the U.S. was largest consumer

The relationship between building construction date and presence of asbestos-containing material



Asbestos-Containing Thermal System Insulation: Facts and Figures
EPA 560/5-88-007, March 1990, Figure 3, Page 7.

Suspect Asbestos Containing Materials

Product type	Purpose	Generally found
Steel fireproofing	Fire protection	Covering structural steel
Thermal insulation	Safety-energy conservation	Steam pipes, boilers and ducts
Thermal Insulation	Safety-energy conservation	Door gaskets around furnaces
Asbestos cement board	Fire protection	Near furnaces and boilers
Asbestos cement	Fire protection	Roofing, felts, shingles and asphalt
Asbestos cement	Fire protection	Transite siding, window caulking

Suspect Asbestos Containing Materials

Product type	Purpose	Generally found
Acoustical	Sound control	Ceilings in classrooms, halls, multi-purpose rooms
Surfacing materials	Reinforcement	Plaster walls, ceilings, skimcoat
Surfacing materials	Reinforcement	Joint compound, textured paint
Textiles	Fire protection	Auditorium curtains, lab aprons and gloves
Wiring	Fire protection	Insulating wrap of old wiring
Tile and sheet flooring	Ease of cleaning, decor	Floors, cove base & adhesives

Commercial Uses

- Label from roof cement containing asbestos.
- At right - 1953 JM ad for roofing and siding

Other Commercial Uses

- Kent cigarettes: Between 1952 and 1956 produced an asbestos cigarette filter called "Micronite" (made with crocidolite) which claimed to remove 7 times more nicotine and tar

Other Commercial Uses

- Ovens, washing machines and vacuum cleaners were lined with asbestos insulation.
- Asbestos filters, mats and board were used in cheese-making, liquor-brewing and processing of other foodstuffs such as cider, sugar, vinegar and mouthwashes.

Other Commercial Uses

- Christmas tree platforms were sprayed with asbestos powder to simulate snow.
- Other asbestos containing products included: flower pots, rugs, draperies, designer coats, place mats, theatre curtains
- Milton Bradley Company: Manufactured between 1967 and 1975 a product called "Fibro-Clay" a school art modeling compound used to make papier mache. Asbestos was used in the formula until 1972.

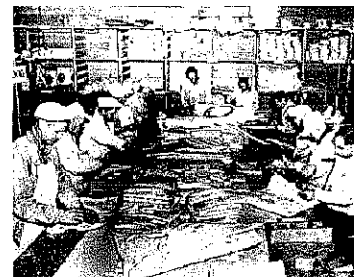
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- What is Asbestos?
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Common Trades Exposed to Asbestos

- | | | |
|-----------------------|------------------------|-----------------------|
| ■ Insulators | ■ Electricians | ■ Boilermakers |
| ■ Pipefitters | ■ Carpenters | ■ Pot tenders |
| ■ Plumbers | ■ Drywall finishers | ■ Welders |
| ■ Boiler Room Tenders | ■ Painters | ■ Sheet metal workers |
| ■ Boilermakers | ■ Plasterers | ■ Railroad workers |
| ■ Steel workers | ■ Iron workers | ■ Brake mechanics |
| ■ Maritime Mechanics | ■ Crane Operators | ■ Refinery workers |
| ■ Shipyard workers | ■ Floor Coverers | ■ Power plant workers |
| | ■ Masons | ■ Paper mill workers |
| | ■ Laborers | ■ Navy men |
| | ■ Construction Workers | |

Shipyards



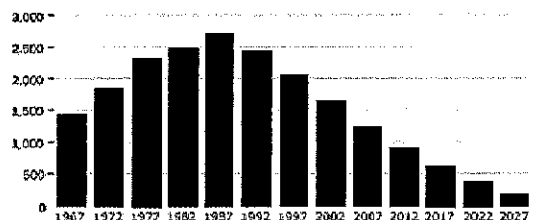
- At left - Workers in a San Francisco shipyard produce asbestos pads for wrapping ship pipes and valves during World War II. Shearing of asbestos cloth made fibers airborne.

Shipyards



- Shipyard workers install half-rounds of asbestos insulation on a ship pipe in San Francisco, in this photo taken before 1970.

Death Toll in U.S. Shipyards



- Bell curve of cancer deaths reflects both the large volume of shipbuilding and repair during and after World War II, and the lengthy latency periods for asbestos-related cancers.
- Asbestosis was first found in Naval shipyards

Asbestos exposure is predicted to cause 225,000 premature cancer deaths by 2009

Source: Asbestos Litigation, the Rand Institute for Civil Justice, 2005

Asbestos use and exposure in the United States and worldwide could be the worst occupational health disaster in modern times.

Health Effects

•Exposure Factors

- Asbestosis
- Mesothelioma
- Smoking and Asbestos

Asbestos Exposure Factors

- Level and duration of exposure
- The time since exposure occurred
- The age at which exposure occurred
- The tobacco-smoking history of the exposed person
- The type and size distribution of the asbestos fibers

10,000 Americans die each year from asbestos related disease

Source: Environmental Working Group

Dose Response

- The body's response to breathing asbestos is dose related:
 - Breathing a large dose of asbestos fibers will produce a bigger health hazard than a small dose.
 - The same dose level will cause disease in some people and no disease in others.
- Mesothelioma is not dose related

Dose Response

- Cases of most severe health problems resulted from asbestos occupational exposure in high doses without any precautions, such as; shipbuilding, mining, milling and fabrication.



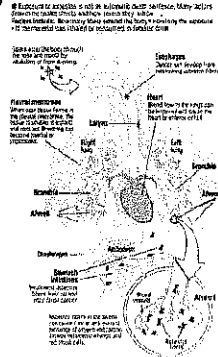
- 1949 JM employee. Reaching in to chrysotile asbestos fibers mixed-in with rayon fibers.

Sensitivity

- One fiber theory
 - Asbestos fibers, once inhaled, remain in the lungs for life
- Zero dose
 - There is no "zero" exposure.
 - Asbestos is present in the air in our atmosphere. This is partly due to the fact that asbestos is a naturally occurring mineral, and partly due to man's usage (and disturbance) of the material.
- Cigarette Smoking
 - A smoker is 50-90% more likely to have an asbestos-related lung cancer than a non-smoker

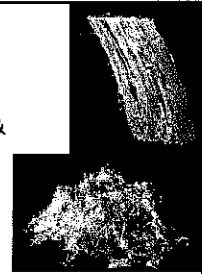
Exposure Pathways

- Inhalation
- Ingestion
- Secondary exposure

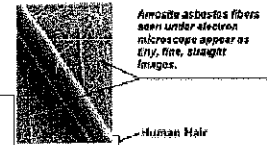


Fibers

- Asbestos fibers are long, extremely thin, microscopic & glass-like
- Fibers are not filtered by the nose or bronchi because they are so thin and light



- Amosite: raw (top) processed (center)



Size Comparison

- An inch of chrysotile asbestos contains about 1 million individual fibrils lying side by side.
- The tiniest fibrils are so small that when airborne, they settle to the ground at a rate of about a foot per hour.



Microscopic View

- Scanning electron micrograph of asbestiform amphibole from a former vermiculite mining site near Libby, Montana.



Microscopic View

- Amosite (top)
- Crocidolite (bottom)



Latency Period

- Defined as the period of time from when an individual is exposed to a hazard to when the individual experiences ill effects of that hazard.
- Asbestosis - 15 to 35 years
- Mesothelioma - 25 to 40 years
- Lung and other cancers - 20 to 30 years

- Workers covered in asbestos dust at Johns-Manville Plant, Waukegan, Illinois (1987)



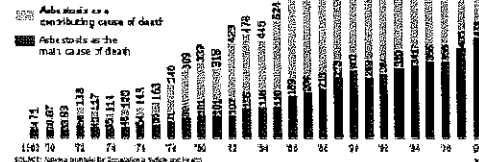
Health Effects

- Exposure Factors
 - Asbestosis
 - Mesothelioma
- Smoking and Asbestos

Asbestosis

ASBESTOSIS DEATHS ON THE RISE

Asbestosis, a lung ailment that reduces its victims' breathing capacity, is the most prevalent disease related to asbestos exposure. And though it has a much lower mortality rate than cancer, the numbers of asbestosis-related deaths in the United States have risen sharply since 1968. In that time, most other occupational diseases have been declining.



Asbestosis

- Scarring of lungs due to inhalation of fibers
 - Fibers lodge in tissue (alveoli) in lungs
 - Because body can't break down asbestos fiber, scar tissue builds around it
 - Oxygen cannot penetrate scar tissue
 - Oxygen starvation sets in
 - Causes shortness of breath, cough
 - Increases risk of serious lung infections
 - Clubbing of fingers and toes
 - In severe cases heart enlargement
 - Typically from high exposures over long period of time
 - Latency period 15 to 35 years

Asbestosis



Asbestosis

- Highest risk is for people who directly handle asbestos material at their job
- Sept. 22, 1958
"... The greatest hazard in your plant is with men handling asbestos. Because just as certain as death and taxes is the fact that if you inhale asbestos dust you get asbestosis." Internal National Gypsum Memo between Gold Bond Operations Manager and Plant Manager in New Orleans.

Scarring of the lungs due to inhalation of fibers

Secondary Exposure Asbestosis

- A hairdresser acquired asbestosis from working with dust-filled hair of asbestos plant workers. A symptom of the disease is clubbing of fingers.



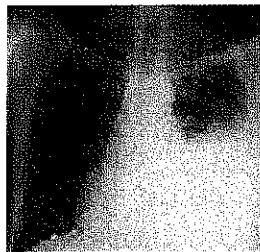
Health Effects

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Mesothelioma

- Cancer of the thin lining surrounding the lung (pleural membrane) or abdominal cavity (the peritoneum)
- Persistent cough, coughing up blood
- Shortness of breath
- Chest pain
- Pain or swelling in the abdomen
- Fatigue
- Significant weight loss

Mesothelioma



Cancer of the thin lining surrounding the lung or abdominal cavity (peritoneum)

- Rarest asbestos-related disease
- Asbestos exposure is the only known cause of mesothelioma
- No link to smoking
- Always fatal
- Survival after diagnosis 5 months to 2 years
- Latency period 25 to 40 years

Secondary Exposure Mesothelioma

- Family members who lived with asbestos workers can also contract mesothelioma
- The woman pictured below has mesothelioma (age 49).
- Her father installed asbestos insulation in power plants and refineries for 28 years.
- He died of mesothelioma at age 61.



Secondary Exposure Mesothelioma

- This man's father worked at the Johns-Manville plant for more than 30 years. His father often came home covered with asbestos dust. His father died of asbestosis.
- Mesothelioma tumors can be seen protruding through the rib cage on his right side. He died at age 36.



Lung and Other Cancers

- One half of all deaths from past asbestos exposure
- Lung and its lining, stomach, esophagus, colon, kidney, larynx and pharynx and mouth
- Persistent cough, loss of appetite, weight loss, pain, weakness
- Latency period 20 to 30 years

Health Effects

- Exposure Factors
 - Asbestosis
 - Mesothelioma
- Smoking and Asbestos

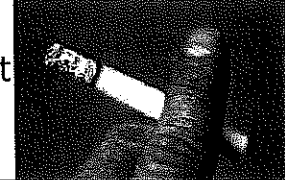
Smoking and Asbestos

- Combination of two carcinogens has a multiplying effect on lung cancer
- Smoking deadens cilia, which are designed to capture contaminants breathed in
- Without proper operation of cilia, more asbestos particles can get deeper into the lungs, increasing the chances of contracting an asbestos related disease

Smoking and Asbestos

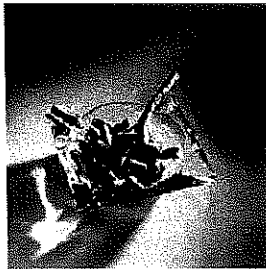
- The multiplying effect of smoking and asbestos related lung cancer:
 - Asbestos worker: 5 times risk factor
 - Smoker: 10 times risk factor
 - Asbestos worker who also smokes: 50 times risk factor

Synergistic Effect



Smoking and Asbestos

- Evidence suggests that asbestos-exposed workers who quit smoking can reduce their risk of developing lung cancer by as much as 50% within five years of quitting
- Smoking cessation programs are available to help you quit



Minimizing Workplace Exposure

Ten Don'ts for ACM



- Drill
- Hammer
- Cut
- Saw
- Break
- Damage
- Move
- Disturb
- Clean with household vacuums
- Direct fans or blowers towards

Increased Exposure Risk

- If you work in a building that has ACM your exposure risk may increase if:
 - Your work area contains friable asbestos, such as sprayed-on insulation.
 - You work near a construction or renovation area which contains asbestos.
 - You are engaged in maintenance or custodial activities in areas containing asbestos.

Preventing Exposure

- In order to avoid being exposed to asbestos, you must be aware of the locations it is likely to be found.
- If you do not know whether something is asbestos or not, assume that it is until it is verified otherwise.
- Remember that you cannot tell if floor or ceiling tiles contain asbestos just by looking at them.

Guidelines to Help Minimize Risk

- If you find any material that you suspect may contain asbestos notify your employer.
- Heed the labels on asbestos products or asbestos waste that warn against causing dust and breathing airborne fibers.

Guidelines to Help Minimize Risk

- Never install curtains, drapes or blinds in a way that damages any potential ACM.
- Try to avoid scraping floor tiles, walls or ductwork when moving furniture.



Guidelines to Help Minimize Risk

- Never hang plants from insulated pipes or otherwise cut through pipe insulation.



- A non-authorized (contractor) worker cut into the asbestos insulation when installing a new gas and water line for this generator unit resulting in an asbestos release and exposure hazard. This occurred even though the insulation was clearly placarded with warning labels (as shown).

Guidelines to Help Minimize Risk

- Wear the proper personal protective equipment when removing ceiling tiles or light fixtures from suspended ceiling grids.
- When removing ventilation system filters, do not shake the filters to remove dust.
- Don't dust, sweep up debris or vacuum carpets in areas that may contain asbestos-contaminated waste.

Damage and Deterioration

- If you work in a building that has ACM, be alert to any deterioration of ACM
- If deterioration is found, disturb the material as little as possible and report it to the building superintendent
 - Examples - damaged pipe insulation, ceiling tile, 9" floor tile, fallen clumps of sprayed-on insulation, etc.
- Take measures to prevent others from disturbing the deteriorated material

Damage and Deterioration

- Always avoid any contact with ACM that:
 - Disturbs its position or arrangement
 - Disrupts its matrix or renders it friable
 - Generates any visible debris from it
- At right - damaged asbestos pipe lagging
- Requires encapsulation or removal



Protection from Exposure

- Identify suspect material
- Perform Negative Risk assessments
- Wear proper Personal Protective Equipment (PPE)

Overview of Regulations

OSHA
NESHAP
ODH
TSCA

What Regulations Apply?

- Occupational Safety and Health Administration (OSHA)
- USEPA National Emissions Standards for Hazardous Air Pollutants (NESHAP)
- Ohio Department of Health (ODH)



OSHA Chronology



- 1972 ■ Enactment of the OSHA Asbestos Standard for General Industry (29 CFR 1910.1001) and Construction Industry (29 CFR 1926.58)
- 1976 ■ OSHA lowers the Permissible Exposure Level (PEL) for asbestos from 5 f/cc to 2 f/cc
- 1986 ■ OSHA lowers the PEL for asbestos from 2 f/cc to 0.2 f/cc
- 1995 ■ OSHA revises Asbestos Standard for the General (1910.1001) and Construction Industry (1926.1101)

General Industry Standard 29 CFR 1910.1001

- Covers manufacturing, specific operations
- Brake and clutch repair
- General housekeeping practices



Construction Industry Standard 29 CFR 1926.1101

- Covers all construction-related activities
- Specific work classifications and procedures
- Multi-employer worksites
- Determine location of ACM and presumed ACM (PACM)



OSHA 29 CFR 1926.1101

- Construction Industry Standard
- Determine the location of the ACM and presumed ACM (PACM) at your facility
- Label ACM wherever feasible
- Inspect and maintain ACM to assure that it remains in good condition
- Implement special work practices and engineering controls for brake and clutch repair if ACM is present

OSHA 29 CFR 1926.1101

- Classification of Work requiring:
 - Initial exposure assessment and monitoring
 - Engineering controls and work practices
 - Respiratory protection and other personal protective equipment (PPE)
- 2 to 40 hours of training, depending on the type of ACM work to be performed
- Medical monitoring and recordkeeping

Permissible Exposure Limits

- Two types of exposure limits
- Time-weighted average (TWA)
 - Allowable exposure over typical eight hour workday without negative health effects
 - 0.1 fibers per cubic centimeter (f/cc) of air
- Excursion Limit (EL)
 - Peak exposure limit over one-half hour
 - 1 f/cc

Air Sample Analysis - PCM

- PCM - Phase Contrast Microscopy
- Used to analyze air samples to determine compliance with the OSHA PEL and EL
- Counts fibers >5 microns
- Can be done on-site



Does not distinguish between asbestos and non-asbestos

Exposure Assessments

- Negative Initial Exposure Assessment
 - How procedures and PPE used relate to exposure
 - Must show exposures will consistently be less than PEL and EL
- Exposure Assessment
 - In lieu of Negative Exposure Assessment
 - Methods, PPE, PEL and EL results evaluated
 - Determine if controls and PPE are appropriate
 - Can be applied to similar jobs under similar circumstances

Exposure Assessments

- Contractors performing abatement at your facility should either provide a negative exposure assessment or conduct an exposure assessment utilizing appropriate personal protective equipment (PPE)

National Emission Standards for Hazardous Air Pollutants

- NESHAP 40 CFR 61
 - 1970 - Clean Air Act establishes National Emission Standard for Hazardous Air Pollutants (NESHAP)
 - 1971 - EPA NESHAP identifies asbestos as a hazardous air pollutant
 - 1984 - Disposal of asbestos waste regulated by the NESHAP standard
 - 1990 - Most recent revision of NESHAP
- Regulates emissions to air and disposal



Applicability

- Any institutional, commercial, public, industrial, or residential structure, installation or building
 - Any structure that is or will be used commercially, including residential conversions
 - All buildings to be used for live fire training
- Asbestos mills, roadways, manufacturing, waste disposal, etc.
- Standards for demolition and renovation

Non-Subject Facilities

- Privately owned homes
- A multi-dwelling unit with four or fewer dwelling units



Categorization Structure

- Friable materials
- Non-friable materials
 - Category I non-friables
 - Category II non-friables
 - Differences in the way materials are handled during renovation and demolition

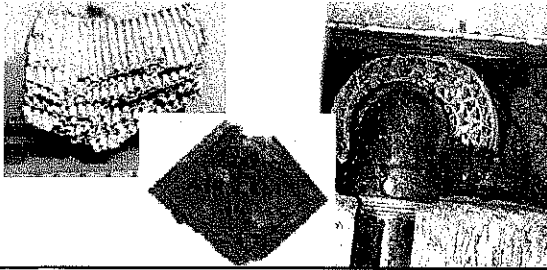


NESHAP - Friable Materials

- Any material containing more than 1% asbestos as determined using approved methods that, when dry, can be crumbled, pulverized or reduced to powder using hand pressure.
- Thermal system insulation, spray-on fireproofing, ceiling tiles, etc.
- Considered to be more "dangerous" because it presents a higher exposure hazard when disturbed

NESHAP - Friable Materials

- The gray corrugated, cardboard-like material pictured is AirCell (or Air-O-Cell) asbestos insulation.

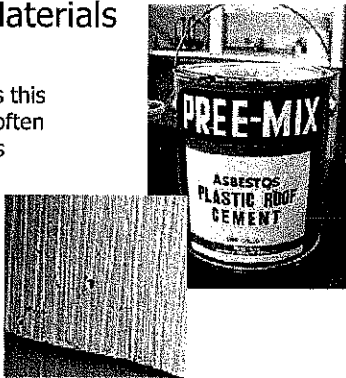


NESHAP - Nonfriable Materials

- Any material containing more than 1% asbestos as determined using approved methods that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
- Asphalt roofing materials, plaster, transite, gaskets, floor tile, mastics, caulking, etc.

Nonfriable Materials

- Asphaltic roofing products, such as this roofing cement, often contains asbestos
- Transite shingles



Category I Nonfriable

- Any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product.
- Although typically non-friable, this material must be inspected and tested for friability. If friable due to deterioration, weathering, etc., it must be handled accordingly.
- Asbestos-containing packings, gaskets, resilient floor coverings and asphalt roofing materials must be removed before demolition only if they are in poor condition and are friable.

Category II nonfriable

- Any nonfriable asbestos-containing material, that is not considered a Category I nonfriable.
- Asbestos-cement products (transite), hard plaster, caulking, asphalt products not used as roofing materials, aluminized paints
- Category II nonfriable ACM subjected to intense weather conditions such as thunderstorms, high winds or prolonged exposure to high heat and humidity may become "weathered" to a point where they become friable.
- May or may not require removal prior to demolition depending on likelihood of becoming friable

NESHAP - RACM

- RACM = Regulated Asbestos-Containing Material
 - Friable asbestos material
 - Category I nonfriable ACM that has become friable
 - Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting or abrading.

NESHAP - RACM

- Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

Notification Requirements

- If greater than 160 square feet, 260 linear feet, or 35 cubic feet of RACM will be removed during demolition or renovation activities, notification is required 10 days prior to work
- Notification requires certain information on contractors, amount of material to be removed, techniques to be used, schedule of activities, etc.

Applicability of Notification for Roofing Projects

- Generally not considered RACM unless subjected to sanding, grinding, cutting or abrading
- If a roof is to be removed by *sawing* into pieces, NESHAPs notification will apply if more than 5,580 square feet of material will be removed



TSCA Ban Issues - Chronology

- **1973** - EPA bans spraying of asbestos containing materials
- **1975** - EPA bans asbestos for pipe covering if friable
- **1977** - U.S. Consumer Product Safety Commission (CPSC) bans asbestos containing patching compounds and artificial fireplaces
- **1989** - EPA Asbestos Ban and Phaseout Rule
- **1991** - Federal Court strikes down many portions of the 1989 EPA Asbestos Ban and Phaseout Rule

TSCA Ban Issues

- 1989 EPA published the *Asbestos: Manufacture, Importation, Processing, and Distribution in Commerce Prohibitions; Final Rule* (40 CFR Part 763, Subpart I).
- The rule planned for a phased-in ban of most asbestos products. The ban was planned to occur in three stages between 1990 and 1996



TSCA Ban Issues

- Ban of new uses of asbestos products still in effect
- 1991 Federal Court ruling did not effect these asbestos-containing product categories:
 - Corrugated paper (aircell)
 - Rollboard
 - Commercial paper
 - Specialty paper
 - Flooring felt

TSCA Ban Issues

- Materials that can still be manufactured or imported (no longer subject to the ban of 1989) are:
 - Friction products; drum brake lining, disc brake pads, clutch facing, automatic transmission components.
 - Industrial and commercial friction products; gaskets, beater-add gaskets and sheet gaskets.
 - Pipeline wrap

TSCA Ban Issues

- Materials that can still be manufactured or imported (no longer subject to the ban of 1989) are (continued):
 - Coatings; roof coatings and non-roofing coatings.
 - Vinyl asbestos floor tile
 - Asbestos cement products: pipe and shingles, corrugated and flat sheets
 - Asbestos clothing

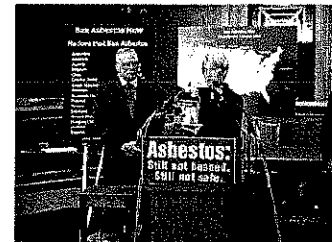
Senate Bill To Ban Asbestos

The current Ban Asbestos in America Act of 2003 (S.B. 1115) would:

- Ban the use of asbestos within two years.
- Require the National Academy of Science to review health effects of asbestos exposure.
- Create a panel to recommend improvements in asbestos laws.
- Establish a national mesothelioma registry to track asbestos victims.
- Create 10 mesothelioma treatment centers.
- Require the EPA to conduct a public awareness campaign about asbestos, including asbestos in insulation.

Senate Bill To Ban Asbestos

- At a news conference to reintroduce the Ban Asbestos in America Act, Sen. Murray holds up a can of plastic roofing cement containing asbestos.



Ohio Department of Health

- OAC 3701-34, Amended Feb. 1, 1994
- Covers the following requirements:
 - Training/Certification
 - Notification
 - Project Design
 - Clearance monitoring
 - Project Agreement
 - Site inspections



ODH Applicability

- Removal, renovation, enclosure, repair or encapsulation of **friable** ACM
- Amount must be greater than 50 linear feet or 50 square feet
- Sprayed on fireproofing



ODH Training and Certification Requirements

- Asbestos Hazard Abatement Contractor (AHAC)
- Asbestos Hazard Abatement Specialist (AHAS)
- Asbestos Hazard Abatement Worker (AHAW)
- Asbestos Hazard Abatement Project Designer (AHAPD)
- Asbestos Hazard Evaluation Specialist (AHES)
- Asbestos Hazard Abatement Air Monitoring Technician (AHAMT)

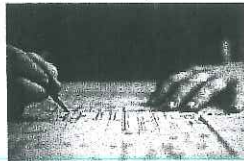
ODH Notification

- Required to be submitted at least 10 days prior to abatement activity
- Applies when greater than 50 linear feet or 50 square feet of friable ACM is involved
- Notification sent to Columbus office



Project Design

- Project design is not required, except for projects that fall under AHERA
- If written direction (specification, work practice, removal procedure, etc) is developed then it is to be designed by an AHAPD



Clearance Monitoring

- Clearance air sampling is defined but not required
- If clearance air monitoring is performed then it is to be by an:
 - AHAMT
 - AHES
 - Certified Industrial Hygienist (CIH)
 - Or an Industrial Hygienist In Training (IHIT) certified by the American Board of Industrial Hygiene
- PCM: Minimum of three samples per work area (all <0.01 f/cc)
- TEM: In accordance with AHERA (average of all inside samples <70 structures/square millimeter)

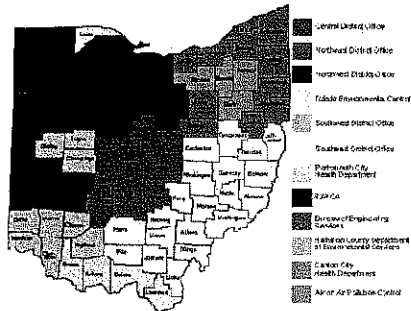
Asbestos Hazard Abatement Project Agreement

- Agreement between Owner and Abatement Contractor, agreeing to the following:
 - All persons working on the project will be licensed or certified by ODH
 - Any clearance monitoring performed will be in accordance with ODH standards
 - All clearance sampling is performed by an AHAMT, AHES or a CIH or an IHIT certified by the American Board of Industrial Hygiene

Asbestos Hazard Abatement Project Agreement

- Agreement between Owner and Abatement Contractor, agreeing to the following:
 - A detailed description of the project work scope including:
 - The amount in linear or square feet of ACM to be abated
 - Exact location and type of material
 - Whether the work site will be established as required by regulations of the US OSHA, 29 CFR Part 1926.58 (1926.1101)

Local Agencies/District Offices Air Pollution Control (APC)



Local Agencies

- Ashtabula, Holmes and Lorain Counties
 - Northeast District Ohio EPA
 - Twinsburg: (800) 686-6330
- Cuyahoga County
 - APC Div., Dept. of Health and Welfare, Cleveland: (216) 441-7400
- Medina, Portage and Summit Counties
 - Akron Regional Air Quality: (330) 375-2480

Local Agencies

- Stark County
 - APC Div., Canton Health Dept.: (330) 489-3385
- Mahoning and Trumbull Counties
 - Mahoning-Trumbull APC: Youngstown: (330) 744-1928
- Lake and Geauga Counties
 - Lake County General Health District Painesville: (440) 350-2543

Asbestos Survey Compliance

OSHA
NESHAP

Asbestos Survey Compliance

- Comply with OSHA to satisfy:
 - Hazard Communication
 - Employee exposure
- Comply with NESHAP to satisfy:
 - Demolition and renovation requirements
 - Public exposure to asbestos

NESHAP

- No specific regulatory survey protocols, but must be "thorough"
- Use of EPA Pink Book and Purple Book recommended for guidance
- Similar protocols as those under AHERA

OSHA - PACM and ACM

- PACM is defined as TSI and surfacing material in buildings no later than 1980
 - Surfacing material is further defined as sprayed or troweled-on material used for fireproofing or acoustical applications (not drywall skimcoat or joint compound)

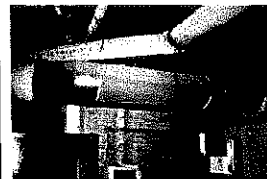
OSHA - PACM and ACM

- Although not specifically considered PACM, asphalt and vinyl flooring installed no later than 1980 must also be considered assumed ACM
- Other materials may need to be considered assumed ACM if there is actual knowledge or are typically considered suspect materials

Categories of ACM

- Thermal system insulation (TSI)
- Surfacing materials
- Miscellaneous materials
 - Vinyl asbestos tile (VAT)
 - Roofing
 - Transite
 - Ceiling panels, etc.

Thermal System Insulation (TSI)



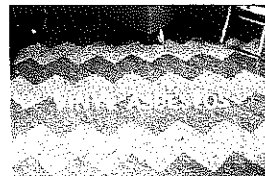
- Many older buildings contain TSI. Here steam pipes are insulated with TSI which is ACM
- Other examples include boiler breeching, duct insulation, HVAC tape, valves and fittings, etc.

Surfacing Materials



- Sprayed-on fireproofing material
- Plaster walls and ceilings
- Anything sprayed- or troweled-on may be considered surfacing material

Miscellaneous Materials



- Vinyl asbestos tile
- Roofing materials
- Transite
- Ceiling tiles
- Gaskets
- Fire curtains
- Wire insulation
- many, many others

Abatement and Demolition

OSHA Classification of Asbestos Work
NESHAP Removal Techniques
NESHAP Demolition Techniques

Who Has Training Requirements?

- US EPA
- OSHA
- State Agencies - ODH

Requirements vary depending on:

- Type of activity
- Amount of potential exposure to worker/environment

OSHA – Training Requirements

- To determine training needs the building owner or employer needs to determine if there is a potential for disturbing ACM

Was the building surveyed?

Was suspect ACM observed?

If ACM was found training will depend on type of work performed by employee

If not, no requirements apply

OSHA Classification of Asbestos Work

- Class I Asbestos Work
 - Activities involving the removal of TSI or surfacing material
- Class II Asbestos Work
 - Activities involving the removal of ACM which is not TSI or surfacing material. Examples: removal of asbestos-containing wallboard, floor tile and roofing shingles

OSHA Classifications of Asbestos Work

- Class III Asbestos Work
 - Repair and maintenance operations where ACM and/or PACM is likely to be disturbed
- Class IV Asbestos Work
 - Maintenance and custodial activities during which employees contact ACM and PACM

OSHA - Methods of Compliance

- Applies to all four classes of asbestos work
- Wet methods must be used
- HEPA vacuum must be used to clean up dust and debris
- Immediate clean-up of waste and debris is required

Class I Asbestos Work

- Activities involving the removal of TSI or surfacing material
- Considered the most dangerous type
- Most stringent rules
- Provide 4 day Worker training

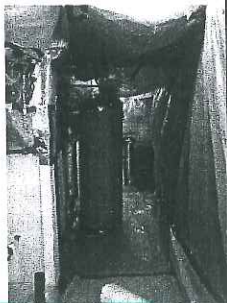


Class I Asbestos Work Requirements

- Applies to removal of large quantities of TSI and surfacing materials (quantities greater than one standard (60" x 60") waste bag or glove bag
- Migration of asbestos from regulated area must be controlled
 - Critical Barriers over openings, or
 - Other barrier or isolation method verified by air sampling

Class I Asbestos Work Requirements

- Isolation of HVAC system
- Drop cloths under work area
- Cover objects in regulated area
- Air filtration of the regulated area through HEPA filters



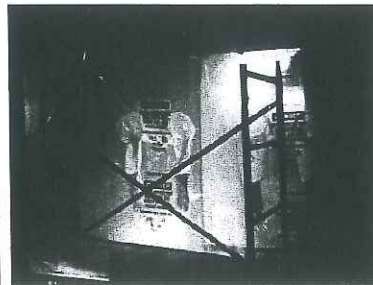
Specific Class I Controls

- Negative Pressure Enclosure (NPE)
 - 4 air changes per hour while maintaining -0.02 inches of water
 - Maintained throughout the regulated area with air movement away from employee

Specific Class I Controls

- Glove bag system
 - 6 mil plastic; seamless bottom
 - Airtight seal and smoke tested
 - Single use
 - Can not be used on lines with temperatures greater than 150 degrees Fahrenheit
 - Collapse with HEPA vacuum
 - Two workers required

Glove Bagging



- Glove bagging is a common removal technique during Class I work.

Specific Class I Controls

- Negative pressure glove bags
 - HEPA vacuum to prevent collapse during removal
 - Vacuum source run continually during removal
- Other controls
 - Negative pressure glove box
 - Water spray system

Class II Asbestos Work Requirements

- Applies when removing amounts greater than one standard (60" x 60") waste bag
- Prevent migration of asbestos from regulated area
 - Critical barriers over openings, or
 - Other barrier or isolation method verified by air sampling
- Drop cloths under work area
- Avoid sawing, abrading, drilling or sanding
- Includes floor tile, roofing products, transite materials, gaskets and many others

Class II Activities

- Activities involving the removal of ACM which is not TSI or surfacing material
 - Examples: removal of asbestos-containing wallboard, floor tile and roofing shingles

Asbestos containing floor tile is one of the most common materials found in older buildings.



Definition of 'Intact'

- OSHA defines intact as 'ACM which has not crumbled, been pulverized, or otherwise deteriorated so that it is no longer likely to be bound with its matrix.'
- Activities such as sawing, drilling, abrading or sanding will make a material not intact
- Slicing with a sharp edged instrument does not make the material not intact (unless the material cut is deteriorated)
- Most often applies to Class II abatement methods

Class III Work Practices

- Class I and Class II techniques for removal will apply, but the quantity must not exceed one waste bag (60"x60") or glove bag
- Maintenance and repair work examples
 - Removal of valve insulation
 - Drilling through ACM plaster or transite panels
 - Removing small amounts of roofing material or floor tile
 - Disturbance of ACM ceiling tile

Class III Work Requirements

- Training requirements are designed to meet specific needs, and are usually 16 hours or less in length
- Training modeled after AHERA requirements for Operations and Maintenance personnel

Class III Work Requirements

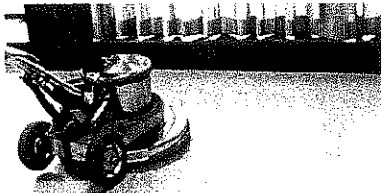
- Class III level training for employees who disturb ACM through maintenance and repair activities
 - Usually a minimum of 16 hours, but can be tailored to specific needs
 - Specific work practices for the materials and operations involved should be developed and used in the training



Class IV Work Requirements

- Apply to operations which workers may come into contact with but not disturb ACM, and cleanup following asbestos abatement operations (Class I, II or III)
- Training requirements are equivalent to Awareness Level training (minimum of 2 hours), and should include restricted activities

Class IV Asbestos Work



- Includes many custodial operations such as buffing ACM floor tile, dusting ceiling tiles, vacuuming in the vicinity of ACM, etc.

NESHAPs Abatement Requirements

- Trained personnel on site during abatement activities
- Demolition
- Fire Training



NESHAP - Trained Person

- No RACM shall be stripped, removed or otherwise handled or disturbed at a facility regulated by NESHAP unless at least one on-site individual trained in provisions of NESHAP regulations.
- Evidence of training posted at worksite
- Responsible to inspect the site at least once a day, preferably at the beginning of the day

NESHAP - Demolition

- ACM need not be removed before demolition if it:
 - Does not fall under the definition of RACM
 - Is on a facility component that is encased in concrete or other similarly hard material and is adequately wet whenever exposed during demolition

NESHAP - Demolition

- ACM need not be removed before demolition if it (continued):
 - Was not accessible for testing and therefore was not discovered until after demolition began and, as a result of the demolition, cannot be safely removed
 - If RACM is not removed for safety reasons, the exposed RACM and any asbestos-contaminated debris must be treated as asbestos-containing waste material and kept adequately wet at all times until disposed of

NESHAP - Demolition Methods

- Heavy machinery razing
 - Bulldozers with rakes, top loaders, backhoes, skid loaders/bobcats, hydraulic excavators, and other similar machinery used for transporting, moving, or dislodging of materials at a demolition site
 - Cranes equipped with wrecking balls, clamshells, or buckets are also considered heavy machinery
 - Interior of building is usually gutted prior to razing
 - Use of heavy machinery during the razing process may cause Category II nonfriable ACM, but rarely Category I nonfriable ACM, to become RACM

A Guide to Normal Demolition Practices Under the Asbestos NESHAP
EPA - 340/1-92-013, Sept. 1992

NESHAP - Demolition Methods

- Implosions
 - Rarely used technique, but often efficient
 - Category I non-friables often can remain, but Category II non-friables must be evaluated on a case-by-case basis



NESHAP - Live Fire Training

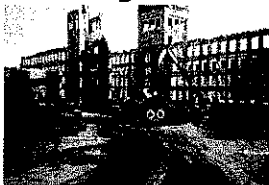
- As stated in the November 1990 asbestos NESHAP revision (see 61.145(c)(10)): "If a facility is demolished by intentional burning, all RACM, including Category I and Category II nonfriable ACM, must be removed in accordance with the NESHAP before burning."

- Abandoned buildings utilized by fire departments for practice exercises involving partial burning are subject to this requirement



Asbestos and Fire Damage

- A fire in this abandoned mill spread asbestos roofing material and pipe insulation to areas as far as six miles downwind from the site



- Photo shows excavation of asbestos containing debris from Baltic Mills, Baltic Connecticut

Operations and Maintenance Program

Hazard Communication
Training
Work Practices
Labeling and Signage

Benefits of an O&M Program

- An Asbestos Management Program serves to tie together all aspects of the OSHA regulation:
 - Inspection and Reinspection
 - Hazard communication for occupants, workers and outside contractors
 - Training
 - Work practices
 - Signs and labels
 - Recordkeeping



Benefits of an O&M Program

- An O&M Program manages the potential for building occupants to be exposed to airborne asbestos by monitoring the condition of asbestos containing material and the likelihood of this material being disturbed.
- Program needs to be designed to meet the needs of the building, based on the ACM present and the level of effort necessary to manage ACM

Benefits of an O&M Program

- An Asbestos Management Program manages the following types of activities and conditions that may release or re-suspend fibers in the air:
 - Routine cleaning
 - Repair and maintenance activities
 - Renovation projects (e.g., remodeling, replacement, additions)
 - Service workers installing telephones, computer cables, life safety systems, etc.
 - Operation of building systems (e.g., heating and cooling, air handling, plumbing)

O&M Training

- OSHA regulations require that all employees who may have contact with ACM as a result of their job must be trained annually.
- Such incidental contact may occur if employees:
 - Perform Class III work practices
 - Clean asbestos-containing flooring (and other Class IV activities)
 - Work in areas where asbestos-containing material may be present (example: insulation on pipes, ducts, boilers, structural steel, or roofing)
 - Install brake or clutch linings

O&M Training

- General information will be provided regarding:
 - Asbestos and its various forms
 - Health hazards associated with asbestos exposure
 - Identification of asbestos-containing materials
 - Recognition of potential risk due to deterioration or delamination of asbestos-containing material
 - Location of ACM in your building

O&M - Hazard Communication

- Owner or Operator must notify affected employees and other employers of the

- Presence
- Location
- Quantity



Of ACM and PACM
in or adjacent to
their work areas

O&M - Hazard Communication

Identify Site Representative who will manage the Program and can be contacted for additional information on appropriate work practices

- The material present, location and quantity
- Appropriate work practices
- Post appropriate signs and labels
 - On ACM or PACM where feasible
 - Demarcate regulated areas

O&M - Hazard Communication

- All contractors involved in, or bidding on, work in areas with ACM/PACM must be notified
- Critical that restricted activities are clear to all



O&M - Signs and Labels

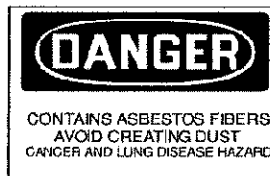
- Identify means in communicating hazard
 - Standard requires signs at entrance to mechanical rooms/areas in which employees reasonably can be expected to enter and which TSI and surfacing ACM/PACM
- Performance oriented requirement
- The degree to which signs and labels are required depends on the exposure potential, access to the asbestos products, and the hazard of the material.

O&M - Signs and Labels

- Signs and labels are required to be posted on or near the product.
- It is generally not feasible to put labels on walls or floors. If it is not feasible, alternatives may be used.
- There may be instances where labeling may not be feasible and color coding is utilized. The employer must then ensure that all employees and contractors have been trained to understand the coding system.

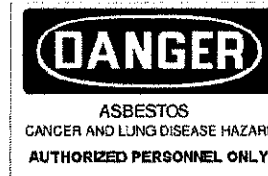
O&M - Signs and Labels

- Red, Black and White Danger labels
 - Labels on ACM



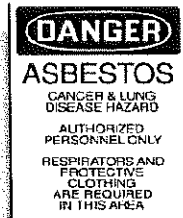
O&M - Signs and Labels

- Red, Black and White Danger labels
 - Posted at Entrances to Mechanical Rooms



O&M - Signs and Labels

- Red, Black and White Danger labels
- Posted at Entrances to Regulated Area



Waste Disposal

- For Class I or II work, any quantity of asbestos waste may be generated
- For Class III work, less than one bag of asbestos waste can be generated
- Bags must be 6-mil, material must be double bagged and kept wet throughout



Waste Disposal

- Bag must be labeled per NESHAPs regulation
 - Generator name
 - Date
 - Standard transport labels
- No special storage requirements prior to disposal except restricted or controlled area
- Transport for disposal by approved carrier and should be manifested

Ongoing Responsibilities

Abatement Project Coordination
Refresher Training
Recordkeeping

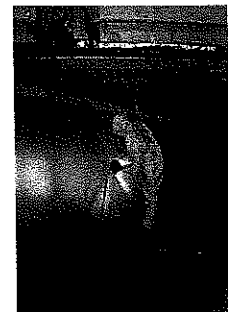
Abatement Project Coordination

- To ensure that the subcontractor performing work follows applicable regulations
- Notify tenants and staff of abatement activities
- Address staff concerns and requests regarding ACM/PACM
 - Subcontractor needs
 - Questions on cleanup of debris, repairs, etc.



What to Look for During Abatement

- Contractor certifications/licenses
- Worker certifications/licenses
- Medical records, fit testing records
- Notifications to regulators
- Engineering controls being used/enforced
- Air monitoring results



Reinspections

- Regular inspection and maintenance is conducted to ensure that ACM is in good shape and any damage is promptly repaired
- Annual re-inspection to be performed by Maintenance Supervisors
- Engineering Department representative will also re-inspect annually
- Keep track of condition, frequency of contact, potential for exposure, etc.



Refresher Training

- All OSHA asbestos work classifications require an annual refresher
- Maintenance Supervisors can provide 2-hour Asbestos Awareness training and refresher for staff



Recordkeeping

- Training records
- Asbestos disturbance, repair or removal documentation
- Contractor submissions
- Inspections and Reinspections



Current Events

Asbestos FAIR Act
Libby, MT
WTC
Global

Asbestos: Still Not Banned

- "Asbestos Ban and Phase out Rule of 1989." **overturned** in 1991 by the U.S. Fifth Circuit Court of Appeals
- Consequently, scores of asbestos products remain on the market today
- FAIR Act contains ban
 - Ban Asbestos in America Act of 2003
 - Introduced by Sen. Patty Murray (D-WA)

Current Events-FAIR Act of 2005

- **F**airness in **A**sbestos **I**njury **R**esolution Act
- Designed to provide compensation to asbestos victims without litigation
- S. 852.IS – April 2005
- H.R. 1360.IH – March 2005

Current Events-FAIR Act of 2005

- Federal government would establish a \$140 billion national trust fund
- Privately funded by asbestos defendant companies and insurers
- Administered by Office of Asbestos Disease Compensation under the Department of Labor
- Funds available to claimants who meet the medical criteria for mesothelioma or other asbestos-related diseases

Current Events – Libby, MT

- Vermiculite mining
- Began 1921 by Zonolite Co.
- W.R. Grace purchased 1963 continued mining until 1990
- Libby mine produced 80% of world's vermiculite
- Vermiculite ore mined in Libby was contaminated with tremolite asbestos, veins of tremolite ran through the mountain
- Dust contaminated the town



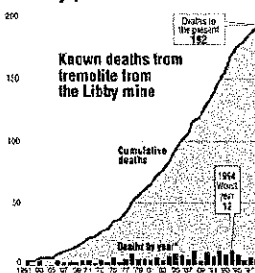
Photo of Libby Mine in operation circa 1970

Current Events – Libby, MT

- Before milling, the raw vermiculite from the Libby mine contained up to 26% asbestos
- The various grades of milled vermiculite shipped from Libby contained asbestos at concentrations ranging from 0.3% to 7.0%

Current Events – Libby, MT

- Asbestos exposure linked to many deaths in Libby
- U.S. Public Health Service estimates that approximately 1/3 of the population of Libby has some type of lung abnormality
 - Asbestosis
 - Lung cancer
 - Mesothelioma



Deaths related in chart attributable to asbestos: lung cancer and mesothelioma only.
 Disease information based on data submitted to various local, state, federal, and private health departments and their families against W.R. Grace. Health records on 12 studies and from other sources by the FBI with family members and physicians in Montana, Colorado, Wyoming, Idaho, Arizona and New Mexico.

Current Events – Libby, MT

- USEPA has been working in Libby since 1999
- Testing soil, dust, air
- Clean-up of contaminated areas
- Medical screening



EPA worker enters a sealed home in Libby to measure asbestos levels in the air before cleaning begins

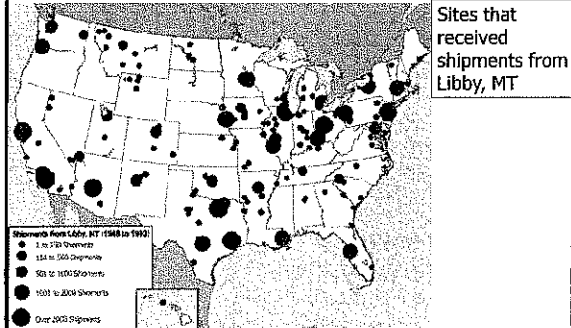
National Asbestos Exposure Review (NAER)

- Agency for Toxic Substances and Disease Registry (ATSDR)
- NAER is an ATSDR project to evaluate over 200 sites that received and processed vermiculite mined in Libby, MT
- ATSDR working with EPA and state health partners to determine whether a hazard to public health exists at any of the sites
- Currently, ATSDR is focusing on 28 Phase I sites

National Asbestos Exposure Review

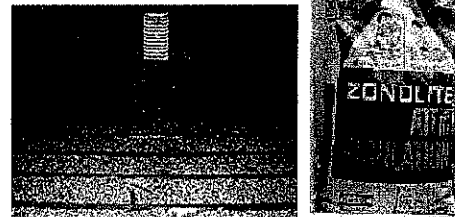
An examination of sites receiving asbestos-contaminated ore from Libby, Montana

National Asbestos Exposure Review (NAER)



Vermiculite Attic Insulation

- Expanded vermiculite is light-weight, fire resistant, absorbent and odorless.
- Was sold as a do it yourself attic insulation from 1925 to 1985.



Vermiculite Attic Insulation

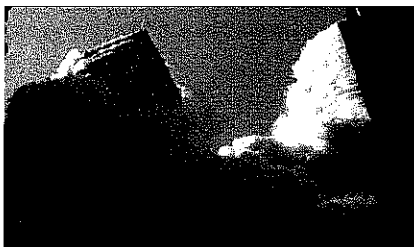
- Awareness Campaign
- United States Environmental Protection Agency
 - <http://www.epa.gov/asbestos/insulation.html>
- Agency for Toxic Substances and Disease Registry (ATSDR)
 - http://www.atsdr.cdc.gov/asbestos/vermiculite_overview.html

From Libby, MT to NYC

- More than 400 tons of asbestos were used during construction of the World Trade Center including:
 - 100,000 80 lb. bags of vermiculite for fireproofing
 - 9,150 pounds of Monokote 3 fireproofing spray used on steel beams during construction
 - Monokote 3 fireproofing spray was formulated with 10% to 19% chrysotile asbestos as an additive



WTC Aftermath



- WTC Collapse released a massive cloud of dust on lower Manhattan

"WTC Signature" Dust

- Dust analyzed after 9/11 has a unique and consistent set of characteristics "WTC signature"
- Dust from WTC collapse was more easily aerosolized and respirable due to unique way it was created
- Asbestos fibers in WTC dust are much thinner, shorter, lighter and more likely to penetrate lung

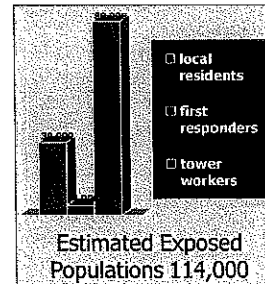


Former Cop Is First Ground Zero Responder To Die

- Jan. 2006 – James Zadroga - 34-year-old New York City police detective, 13 year veteran of NYPD dies after developing black lung disease and mercury on the brain from working at the World Trade Center site
 - Officer was in Bldg. 7 when it collapsed
 - Spent 470 hours in the first month after the September 11th, 2001, collapse of the trade center in rescue and recovery efforts, working up to 16 hours a day at the site
 - Police Union officials claim he is 1st emergency responder to die as a result of exposure to World Trade Center dust and debris

Sept. 11 – Health Problems

- Tens of thousands suffering from health problems likely caused by exposure to toxins at or near WTC
 - First responders
 - Lower Manhattan residents and workers
 - Federal employees



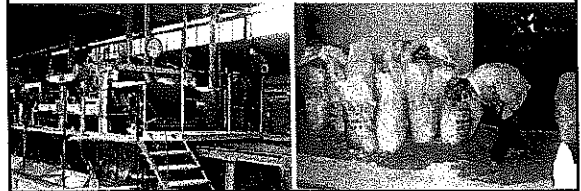
Air contained asbestos, lead, mercury, powdered glass and other carcinogens

Asbestos is Still Big Business

- In 2004 the Canadian government, with the support of Russia, the largest producer of asbestos, and 13 other asbestos-producing countries, blocked the addition of chrysotile (white) asbestos to the UN list of highly dangerous substances that cannot be exported to developing countries without their knowledge and agreement

Asbestos – Canadian Exports

- Canada exports 300,000 tons of white chrysotile asbestos each year to countries like India, Chile and Thailand, where it is processed without safety controls or the use of respirators.



Asbestos - Russia

Mining and marketing asbestos are still huge worldwide industries



- Russia, China and Zimbabwe are known to be mining and processing asbestos
- Ak-Dovurak asbestos mine in Tuva, Russia
- One of largest open pit asbestos mines in the world
- Ak-Dovurak means "white dust"

Asbestos - Western Australia

Western Australia has the highest rate of malignant mesothelioma of anywhere in the world per capita of population



- Bagging area for Crocidolite "blue asbestos" at mill for **Wittenoom mine** in western Australia
- Conditions were so bad that the men needed flood lights to see through the dust at midday

Asbestos – South Africa



- Asbestos Street in Prieska, a town near an asbestos mine in the Northern Cape of South Africa

- In Prieska, a crushing mill operated from 1930-1964 in the center of town near the school, residential and business areas
- Residents of Prieska were exposed to asbestos fibres in a thick layer of asbestos dust which covered the houses
- Local residents describe how they had to pick asbestos fibres out of their food and blow it off their drinking water

In Prieska - 1 in 8 deaths are caused by mesothelioma

Hands-On Training

Glovebag Operations

Glovebag Operations

- Removal of a small section of pipe insulation or fitting to facilitate repairs or replacement.
- Video describes key items to look out for

Thank You For Participating In Today's Training

If we can be of further assistance
please contact us.

EA Group
(440)951-3514



August 2, 2021

Mr. William Wade
Mr. Rick Kolar
Mentor Public Schools
6451 Center Street
Mentor, Ohio 44060

RE: **Class III Asbestos Work Practices Operations and Maintenance Courses – July 2021**
Mentor Public Schools, Mentor, Ohio
OH44155

EA Group, Mentor, Ohio was contracted by Mentor Public Schools to provide Class III Asbestos Work Practices Operations and Maintenance courses for various employees. To date, Class III training has been conducted on July 15 and 16, 2021, July 20 and 21, 2021, and July 26 and 27, 2021, for a total of 30 employees (10 each session). The training courses included hands-on training, which focused on clean up, drilling, cutting, intact removal, and glove-bagging/mini-containment work for asbestos-containing material (ACM), and dust control and PPE for removal of non-ACM ceiling panels. The courses were conducted by EA Group's licensed Asbestos Hazard Evaluation Specialist/Assessment Specialist, Scott Landis, ES31801/AS24684.

Attached are Certificates of Completion and copies of sign-in sheets for the individuals who attended the training courses in July 2021 (all passed the relevant exam).

If you have any questions or require additional information, please contact the undersigned. Thank you for consulting EA Group.

Sincerely,

EA Group

Timothy S. Bowen,
Vice President/Technical Director

Scott Landis
ES31801

